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| EXAMINER | |
|---|---|
| AMINI, JAVID A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2628 | |

DATE MAILED: 04/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/816,318 | PRAKASH ET AL. | |
| | Examiner | Art Unit | |
| | Javid A. Amini | 2628 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *18 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,10-15,22,23 and 26* is/are rejected.

7)☒ Claim(s) *4-9,16-21,24,25 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

***Response to Arguments***

Applicant's arguments filed 1/18/2006 have been fully considered but they are not persuasive.

Applicant on page 8 last paragraph argues that Nuio fails to teach and calculate a plurality of data points that represent pixel data values " ... creating a rotated image substantially free of aliasing error using weighted sums of a plurality of data points of the first image that represent pixel data values of the first image, wherein weighting depends on a skew angle of the first image and data point location in the first image".

Examiner's reply: Contrary, Nuio on page 527 section I teaches each pixel of the image (e.g., made up of *5* 16 X *5* 16 pixels) is shifted in parallel with each coordinate axis. Also on the same page second col. teaches only a base pixel is rotated by the calculation of (1), and the rotated $X$ and $Y$ coordinates for the neighboring pixel are obtained by adding $\cos\theta$ and $\sin\theta$ to the X and $Y$ coordinates of the rotated base point, respectively. Therefore, each pixel value or data points contains different value.

Examiner's note: Applicant uses the terms "weight", "weighted" and "weighting" through out the specification, and specified these terms depend on skew angle and data point. But Applicant does not explain the factors that make up these terms, e.g., are they considered as a weight function, discrete weights, continuous weights or etc.

Applicant on page 9 at first paragraph argues that the reference Nuio does not rotate an image using a plurality of data points.

Examiner's reply: on page 527 under subject of "Application of Pseudorotation" teaches if a box is skewed by a horizontal force, not only ordinate values but also abscissa values are

changed. Therefore, first we skewed the image PI P2 P3 P4 to Ql ***Q2 Q3*** **Q4** by an angle of θ while keeping the ordinate value of each pixel constant, and next skewed the image ***Q, Q2 Q3 Q4*** to ***R1 R2 R3 R4*** by an angle of **θ** while keeping its abscissa value constant as shown in Fig. 1.

Applicant on the same page last five lines argues similar to the previous argument i.e. the reference Nuio simply shifts x and y coordinates of pixels while retaining the same pixel value.

Examiner's reply: on page 527 under subject of "Application of Pseudorotation" teaches if a box is skewed by a horizontal force, not only ordinate values but also abscissa values are changed.

Applicant on page 10 at first paragraph argues unsupported factual assertions for the following Examiner's interpretation: (initial image data from the image buffer is obvious because the images should be stored temporally or permanently in the memory or buffer areas). Or it would have been obvious to a person skill in the art for the following terms: "weighting depends on a skew angle of the first image and data point location in the first image".

Examiner's reply: the image data or the pixel values or data points of an image must be stored in a memory in order to display the image data. On page 527 under subject of "Application of Pseudorotation" teaches if a box is skewed by a horizontal force, not only ordinate values (i.e. parallel to y-axis) but also abscissa values (i.e. parallel to x-axis) are changed. Applicant on page 4 of the specification defines using weighted sums of data points... Nuio on page 527 at second col. teaches, since (1) contains four multiplications and two additions; it takes a very long time of actual calculation for an image made up of a lot of pixels.

Applicant on page 10 at the middle of the page argues that the second reference Chien does not teach that weighting depends on a skew angle.

Examiner's reply: Chien in fig. 5 illustrates clearly a skew angle rotation of two symbols using various methods.

Applicant at bottom of page 10 argues that Nuio and Chien do not teach a method of rotating an image in an image buffer.

Examiner's reply: Nuio at page 531 in fig. 8 illustrates a circuit for rotating one pixel, and a data bus of memory and various controlling lines. Chien on page 484 col.1 at third paragraph teaches a simple method to eliminate hole is an inverse mapping method in which the pixel value of a rotated image buffer is determined by inversely mapping every point of the rotated image buffer to the original image buffer. Chien on page 485 col. 1, in fig. 2 teaches that all the bit patterns are rotated in advance and stored in a buffer with their addresses.

Applicant on page 11 argues similar to the previous arguments.

Examiner's suggestion: Encourages Applicant to schedule an interview.

### *Allowable Subject Matter*

1. Claims 4-9, 16-21, 24-25 and 27, objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 4-9, 16-21, 24-25 and 27, allowed, because of the following algorithm to the first image data: Vo = Kh * Kv (V1 + V4 - V2 - V3) + Kh (V3- V4) + Kv (V2- V4) + V4, wherein Vo is a data point of the rotated image; V1, V2, V3 and V4

are first image data points that each incorporate a portion of Vo; and Kh and Kv are fractions that are functions of skew angle and data point location of the first image.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 10-15, 22-23, and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Nuio Tsuchida et al. (hereinafter refers as a Nuio), and further in view of over Sung-II Chien (hereinafter refers as a Chien).

2. Claims 1-2, 10, 23 and 26.

Nuio on page 527 at second col. section II discloses that in order to rotate an image by an angle of θ, it is necessary to calculate the equation (1), which is a kind of affine transformation, for each coordinate of every pixel. Since (1) contains four multiplications and two additions, it takes a very long time of actual calculation for an image made up of a lot of pixels. Therefore, in many image processors, e.g., (l), only a base pixel is rotated by the calculation of (1), and the rotated *X* and *Y* coordinates for the neighboring pixel are obtained by adding cos θ and sin θ to the X and *Y* coordinates of the rotated base point, respectively. The other rotated coordinates are obtained with repeats of the same procedure. An image is rotated very quickly with this method, since it does not require any treatment except two additions of decimal fractions and the procedure to find the nearest pixel for calculated coordinates. However, it is necessary to be aware of the fact

that large coordinate errors may be accumulated by continuous additions, especially in the case of a small-scale **8-bit** microcomputer. Nuio has developed quite a new method of rotating an image in the same manner as a rectangle is skewed to a parallelogram by a horizontal force, and restored to the rotated original rectangle by skewing with a vertical force. "A method of rotating a first image in an image buffer, (Examiner's interpretation: initial image data from the image buffer is obvious because the images should be stored temporally or permanently in the memory or buffer areas) the method comprising the steps of: extracting first image data from the image buffer". Nuio Fig. 6(a)-(d) shows the original and rotated images made up of **256 X 256** pixels. Here Nuio is applying the rotation angles within **45**, since an arbitrary rotation angle can be obtained easily by adding or subtracting this angle to/from that of integerfold of **$\pi$/2,** and the rotation error of the *Y* coordinate increases rapidly with approach of the angle to 90 as will be mentioned afterwards. In these conditions, the rotation method is tolerable for practical use since the deterioration in image quality is not so noticeable (Examiner's interpretation: i.e. equivalent to what Applicant claims as "substantially free of aliasing error...), see following statement: "creating a rotated image substantially free of aliasing error using weighted sums of a plurality of data points of the first image that represent pixel data values of the first image", Nuio in fig. 1-3 illustrates a plurality of data points of the images, e.g. X1, Y1, X'2, Y'2, and so on. For more information see Nuio on page 527, at second col. section "A". The following step is obvious, because a person skill in the art would have used the same terminology as: "wherein weighting depends on a skew angle of the first image and data point location in the first image" Nuio in figs. 6c-d illustrates the weighting depends on a skew angle. Nuio does not explicitly specify the document is a scanning document, however, Chien on page 486 under "*C. Coarse Block Rotation*"

teaches the step of the scanning document. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Chien into Nuio in order to accomplish the current claim invention.

3. Claim 3,

The method of claim 1, further comprising the step of storing the first image data in a database. The computer in the claim 1 can be considered as a database.

4. Claim 11.

The system of claim 10, wherein the data points of the initial image are in adjacent rows of the image buffer. Chien in fig. 3 illustrates the adjacent rows and columns.

5. Claim 12.

The system of claim 11, wherein a pair of data points are used from each of the adjacent rows of the image buffer. The step is obvious because Chien in equation 1 illustrates the data points by (x, y, x' and y').

6. Claim 13.

The system of claim 10, further comprising an image generation module configured to create the initial image. Chien in fig. 4 illustrates the rotation of an image that is the same as an initial image.

7. Claim 14.

The system of claim 13, further comprising a scanner for supplying data to the image generation module. See rejection of claims 1-2 and 10.

8. Claim 15.

The system of claim 10, further comprising a database configured to store initial image data. See rejection of claim 3.

9. Claim 22.

The step of "A workstation comprising the system for rotating an initial image stored in an image buffer of claim 10" is obvious because a person skill in the art could have installed the computer mentioned on page 488 in first col. lines 17-20 in Chien into the network with a server. Then the computer refers as the workstation. Otherwise the applicant should be willing to specify the significant of the term used as "a workstation".

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A. Amini whose telephone number is 571-272-7654. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on 571-272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2628

Javid Amini

Kee M. Tung
Primary Examiner